KIVILIS, S.S.; KUZNETSOVA, M.I., red.

[Regulations 28-64 for measuring the consumption of fluids, gases and steam by standard diaphragms and nozzles] Pravila 28-64 izmereniia raskhoda zhidkostei, gazov i parov standartnymi diafragmami i soplami. Izd. ofitsial'noe. Moskva, Izd-vo standartov, 1964. 146 p. (MIRA 18:2)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.

KIVILIS, S.S.

[Regulations 28-64 on the measurement of the consumption of liquids, gases and vapors by standard diaphragms and nozzles] Pravila 28-64 izmereniia raskhoda zhidkostei, gazov i parov standartnymi diafragmami i soplami. Izd. ofitsial'noe. Moskva, Izd-vo Standartov, 1964. 148 p. [Album of diagrams for....] Al'bom grafikov k.... (MIRA 18.5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.

KIVILIS, S.S.; GAFANOVICH, M.D.

Measurement of consumption by pressure drop with an automatic compensation of gas parameter changes. Izm. tekh. no.12:40-45 D '64. (MIRA 18:4)

L 2264-66 EWT(d)/EWP(v)/EWP(k)/EWP(h)/EWP(l)

ACCESSION NR: AP5011062 UR/0115/65/000/003/0052/0054

AUTHOR: Kivilis, S. S.; Reshetnikov, V.A.

TITLE: The effect of steady-state flow profile on the error of ultrasonic flow-meters

SOURCE: Izmeritel'naya tekhnika, no. 3, 1965, 52-54

TOPIC TAGS: hydromechanics, hydraulic engineering, ultrasonic flow meter, pipeline flow, ultrasound, flow profile, velocity distribution curve

ABSTRACT: The authors discuss the effect of the flow profile contour on the systematic error of flow-meters, noting that this is one of the most important problems in the measurement of flow rates by means of ultrasound. It is noted that when determining the rate of flow of a liquid passing through a pipeline, it is essential to know the velocity averaged over the flow cross section. These averaged velocities are related by a non-linear function, the analytical expression for which (in the case of a cylindrical pipeline) is presented and analyzed in the article. Attention is called to the fact that, while this expression and others similar to it suggested by various authors are based on a logarithmic law for the distribution of velocities in the pipeline, when x = const. this law is merely an approximate description of the actual velocity distribution curves and the constant x, used in the expression of the logarithmic law, changes even within the limits

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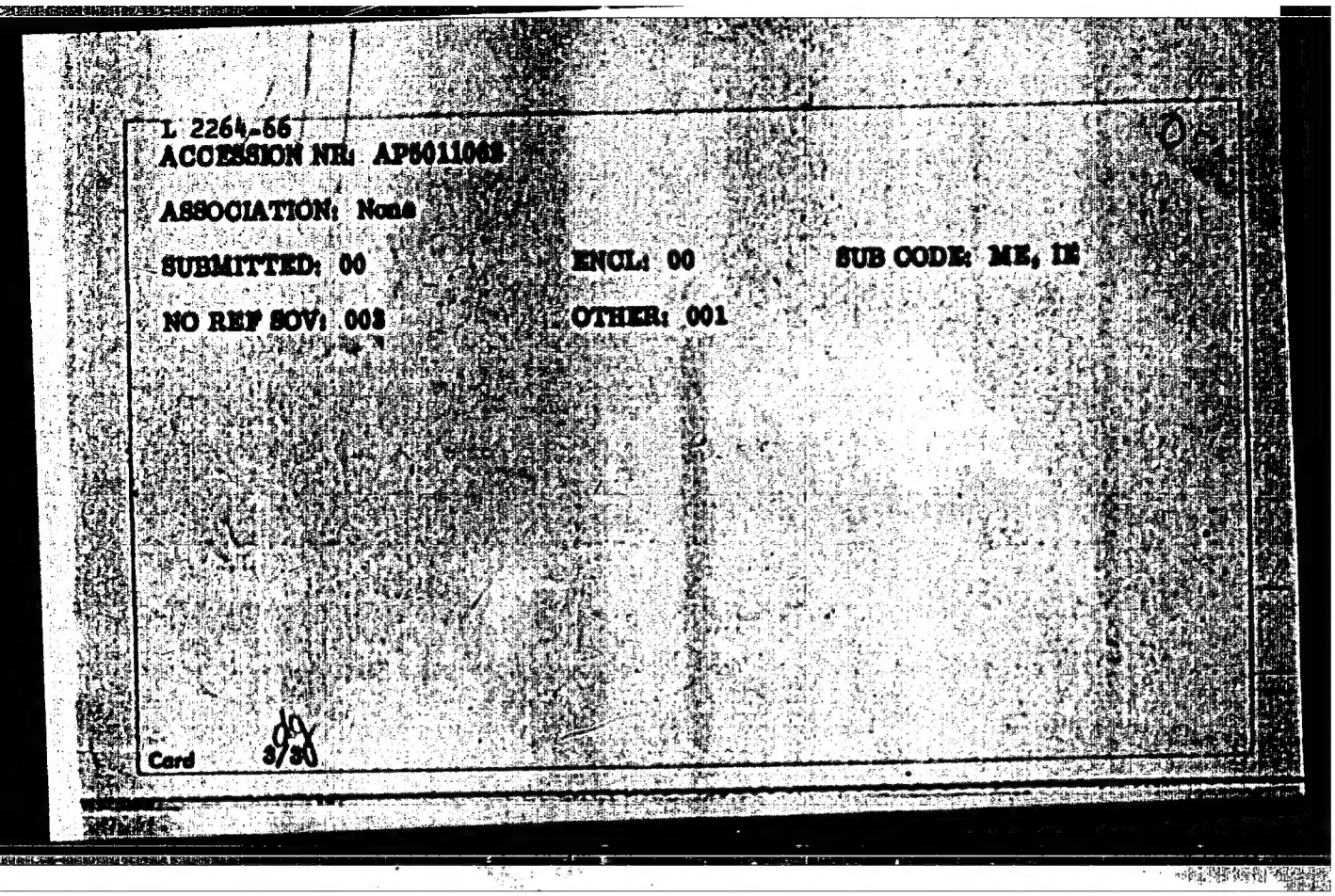
L 2264-66

ACCESSION NR: AP5011062

of a single velocity distribution curve for a constant Reynolds number. The authors therefore attempt to determine the effect of the velocity profile in the stream on the accuracy of ultrasonic flow-meter readings by means of a direct integration of experimentally derived velocity distribution curves. Expressions are obtained for the mean velocity of a flow of any configuration and for the mean velocity along the ultrasound propagation path. In this way, an accurate formula is derived describing the relationship between these velocities for a flow of any configuration. This expression is modified for the particular case of a steady-state stream in a cylindrical pipeline of given radius, with the ultrasound propagating in a plane which passes through the axis of the pipe. Steady-state flow velocity distribution curves are given in the article for different Reynolds numbers running from 4.10^3 to 3.10^6. A Chebyshev formula was used as the working formula in the integration of velocity distribution curves, with the basic data taken from the table of Nikuradze (Problemy turbulentnosti. ONTI, M.-L., 1936). The results of this computational work are presented in a separate figure, from which it is clear that for Reynolds numbers up to approximately $20 \cdot 10^3$ there is good agreement between the results obtained using the equations given in the first section of the article and the data obtained by direct integration of the velocity curves. Finally, an empirical formula is offered, expressing the quantity m as a function of the Reynolds number and obtained on the basis of the distribution integration carried out previously. This formula is simple and may be used in practical computations. Orig. art. has: 2 figures and 11 formulas.

Card 2/3



L 2264-66
ACCESSION NR: AP5011063

ASSOCIATION: None

SUBMITTED: 00 ENCL: 00 SUB CODE: ME, IE

NO REF SOV: 002 OTHER: 001

Card 3/30

L 2598-66 EWT(d)/EWT(l)/EEC(k)-2/EWP(v)/EWP(k)/EWP(h)/EWA(h)/EWP(l)
ACCESSION NR: AP5019201 UR/0115/65/000/006/0053/0057
531.732/3(083)

AUTHOR: Kivilis, S. S.

TITLE: Measuring rate-of-flow of liquids and gases by restriction-type differential manometers

SOURCE: Izmeritel'naya tekhnika, no. 6, 1965, 53-57

TOPIC TAGS: manometer, differential manometer

ABSTRACT: Fundamentals of the new "Rules 28-64 for measuring rate-of-flow of liquids, gases, and steam by standard orifice plates and nozzles" are discussed. Connected with the International Standard Organization (ISO) provisions, these "Rules" are applicable to measuring the flow of single-phase liquids, gases, and superheated steam by a restriction mounted inside a pipe 50-mm or more in diameter, for a steady-state flow, certain Re numbers and pressure ratios. The Venturi tubes have not been standardized as yet. Saturated

Card 1/2

L 2598-66
ACCESSION NR: AP5019201

steam and pulsating flows are not to be measured with differential manometers. Mass flow, instead of weight flow, is dealt with. Formulas, curves, and tables for designing restrictions are provided in the "Rules"; also, the Section on gas compressibility has been "materially reworked." Nomographs are supplied for determining the optimal nominal pressure drop caused by a restriction. International requirements of restrictions are adopted. Methods for determining the measurement error have been developed. Orig. art. has: 3 figures, 13 formulas, and 1 table.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: IE, ME

NO REF SOV: 008 OTHER: 012

Card 2/2

f. vmeter

ABSTRACT: An Author Certificate has been issued for a f. vmeter. See Fig. of the ... based on the measurement of the ... The range of measurement ... a swirling element ... pressure in the flow ... and a tube for measuring the pressure ... periphery. Orig. art. has: 1 figure.

[AC]

SUBMITTED: 15Aug64 ENCL: 01 SUB CODE: ME, IE

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4037

Card 1/2

ACCESSION NR: AP5016749

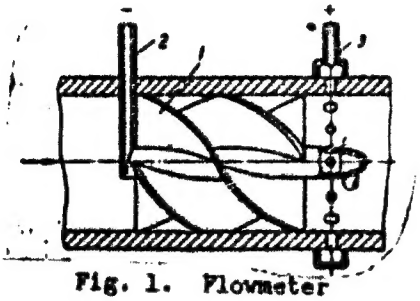


Fig. 1. Flowmeter

1 - Swirler; 2 - core pressure tube; 3 - periphery pressure tube.

Card 2/2

KIVILIS, S.S.; REBRETNIKOV, V.A.

Hydromechanical error of ultrasonic flowmeters. Izm. tekh. no.11:48-50 N '65. (MIRA 18:12)

L 35845-66 EWT(1) JAJ

ACC NR: AP6014523 SOURCE CODE: UR/0115/65/000/011/0048/0050

AUTHOR: Kivilis, S. S.; Reshetnikov, V. A. 59

ORG: none B

TITLE: Hydromechanical error of ultrasonic flowmeters

SOURCE: Izmeritel'naya tekhnika, no. 11, 1965, 48-50

TOPIC TAGS: fluid mechanics, ultrasonic equipment, flow meter, ERROR CORRECTION

ABSTRACT: Presently known types of ultrasonic flowmeters can be divided into three groups, depending on the velocity of the flow being measured. The article gives a table showing the main characteristics of these types, using the following nomenclature: l_0 is the distance between the radiating and receiving piezo-transformers; $u(l)$ is the distribution of the flow velocity along the propagation path of the ultrasound; v_0 is the flow velocity along the axis of the pipeline; v_m is the maximum flow velocity; r_0 is the radius of the pipeline. Keeping in mind that the correction coefficient

$$n = \frac{v}{v_\omega}, \qquad (1)$$

where v is the velocity to be measured; v_ω is the average velocity over

Card 1/2 UDC: 531.732.083

Card 2/2

KIVILO, Evald; RAIG, H., otv. red.

[Elementary course in hygiene for workers of dairy farms] Sanitaarminimumi kursus piimakarjafarmide töötajaile. Tartu, Vabariiklik sanitaarhariduse maja, 1962. 61 p. (MIRA 16:12)

KIVILO, M., i PURDE, M.

Use of semiautomatic inhalation anesthesia experiments on animals. Biul. eksp. biol. i med. 58 no.10:124-125 O '64.
(MIRA 18:12)

1. Estonskiy respublikanskiy onkologicheskiy dispanser (glavnyy vrach A.N. Gavrilov) i Estonskiy institut eksperimental'noy i klinicheskoy meditsiny (dir. - prof. P.A. Bogovskiy) AMN SSSR. Submitted July 15, 1963.

KIVIL'SHA, Ye.A.

Treatment of otogenous cerebral abscesses. Vest.oto-rin. 17 no.1: 60 Ja-F '55. (MLRA 8:5)

1. Iz otdeleniya bolezney ukha, gorla i nosa bol'nitsy im. Lenina, Kamenets-Podol'skiy.
(BRAIN--ABSCESS)

KIVILSHA, I. E., Cand of Tech Sci -- (diss) "On the Problem ofthe Use of Local Cement Made from Chalky Marl," Kaunas, 1959, 31 pp (Kaunas Polytechnical Institute) (KL, 2-60, 113)

METŠIK, R.; TOMBERG, A.; RAJAVEE, E. [Rajavee, E.]; KIVIMAA, Kh. [Kivimaa, H.]

Investigating phenols extracted from semicoking shale tars by sodium carbonate aqueous solutions. Khim. i tekh.gor.slan. i prod. ikh perer. no.12:181-192 '63. (MIRA 17:2)

SHELOUMOV, V.V.; KIVIMAA, Kh.M. [Kivimaa, H.]

Centrifugation of heavy shale tars. Khim. i tekh. gor. slan. i prod. 1kh perer. no.11:220-229 '62. (MIRA 17:3)

SHELOUMOV, V.V.; METSIK, R.E.; KAL'BERG, A.O. [Kalberg, A.]; KIVIMAA, Kh.M. [Kivimaa, H.]

Preparing oil shale tar for distillation. Khim. i tekh. gor. slan. i prod. ikh perer. no.10:174-190 '62. (MIRA 17:5)

KHYUSSE, I.Yu.; SHELOUMOV, V.V.; RAYAVEYE, E.L.; METSIK, R.E.; KIVIMAA, Kh.M. [Kivimaa, H.]

Certain possibilities of increasing water soluble phenol resources. Khim. i tekh. gor. slan. i prod. ikh perer. no.11:230-235 '62. (MIRA 17:3)

KIVIMYAGI, E.A.; YUDOVICH, E.A.

Amazine treatment of patients with schizophrenia suffering from pulmonary tuberculosis. Zhur.nevr.i psikh. 61 no.2:247-250 '61. (MIRA 14:6)

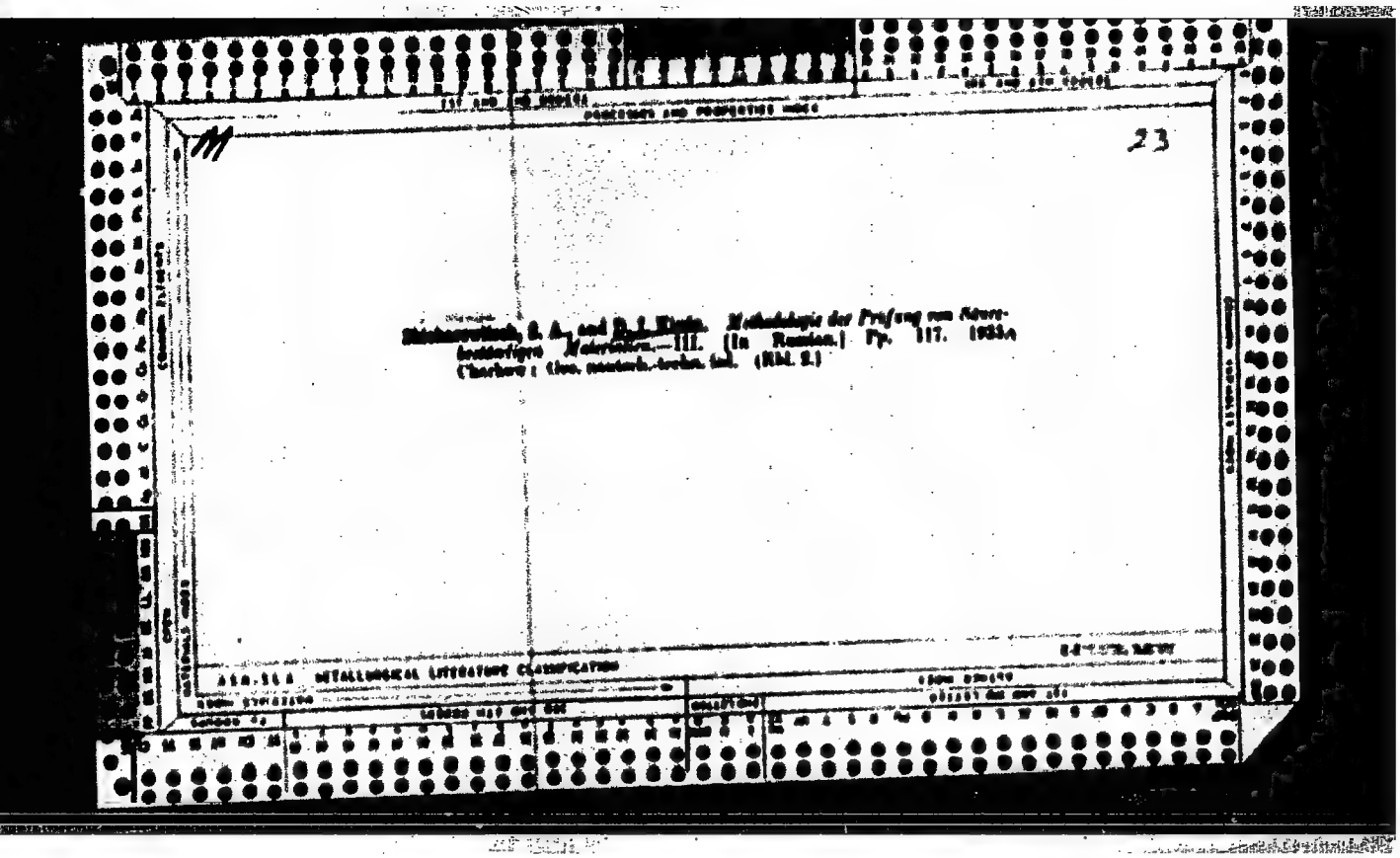
1. Ryazanskaya psikhonevrologicheskaya bol'nitsa (glavnyy vrach V.V.TSarichenko, vypolnena pod rukovodstvom prof. A.K.Strelyukhina).
(TUBERCULOSIS) (SCHIZOPHRENIA)
(CHLORPROMAZINE)

KIVIN, Abram Naumovich, inzhener; UGAROV, I.P., inzhener redaktor; KANDYKIN, A.Ye., tekhnicheskiy redaktor

[Running trains without stopping to take on water; a collection of articles] Vozhdenie poezdov bez ostanovok dlia nabora vody; sbornik statei. Moskva, Gos.transp.zhel-dor.izd-vo, 1955. 42 p. (MLRA 8:10)
(Railroads--Water-supply)

YEVDOKIMOV, I.I.; ALEKSEYEV, V.D.; ASHIKHMIN, A.K.; BAYEV, N.V.; BEGLAR'YAN, P.A.; BYCHKOV, I.A.; VASILOVA, Ye.T.; VYZHEKHOVSKAYA, M.P.; GURETSKIY, S.A.; DEMIDOV, I.M.; YESIPOV, Ye.P.; ZHUKOV, V.D.; ZELINSKIY, M.G.; ZOL'NIKOV, F.T.; ZOLOTOVA, L.I.; KIYLIN, A.N.; KOMARNITSKIY, Yu.A.; KONSTANTINOV, A.N.; KUL'CHITSKAYA, A.K.; MAKSIMENKO, I.I.; MELENT'YEV, A.A.; MOROZOV, I.G.; MURZINOV, M.I.; OZEROVSKIY, Ch.S.; OSTRYAKOV, K.I.; PANINA, A.A.; PAVLOVSKIY, V.V.; PERMINOV, A.S.; PERSHIN, B.P.; PRONIN, S.F.; PSHENNYY, A.I.; POKROVSKIY, M.I.; RASPOPOMAREV, Ye.A.; SEMIN, I.N.; SKLYAROV, Yu.N.; TIBABSHIN, A.I.; FARBEROV, Ya.D.; FEDOROV, G.P.; SHUL'GIN, Ye.S.; YAKIMOV, I.A.; VERINA, O.P., tekhn.red.

[Labor feats of railway workers; stories about the innovators] Trudovye podvigi zheleznodorozhnikov; rasskazy o novatorakh. Moskva, Gos.transp.zhel-dor.izd-vo, 1959. 267 p. (MIRA 12:9)
(Railroads) (Socialist competition)



PROCESSES AND PROPERTIES INDEX

Methods for testing acid-stable materials. S. A. Zhikharevich and D. I. Kivin. (Trans. Nauch.-Issledovatel. Inst. Ogneuporov i Kislotouporov 32, 113 pp. (1936). —A series of rational methods was developed for detg. the soly. of bodies in acids, and for measuring their d. The work was based on the Kallauner-Barta method supplemented by (a) dissolving the tiny sulfuric crystals by heating them on a water bath, (b) neutralizing "acid" grains (grains treated with H_2SO_4) in the presence of methyl orange, (c) neutralizing "alkali" grains (grains treated with Na_2CO_3) in the presence of phenolphthalein.

M. V. Kondoidy

METALLURGICAL LITERATURE CLASSIFICATION

KIVIN, D. I.

USSR/Engineering
Metallurgical Plants
Dolomite

Jun 1947

"Dolomite Bricks in Metallurgy," Prof O. V. Kukolev, Dr Tech Sci; D.I. Kivin, Engr, All-Union Inst Fireproof Materials, 5 pp

"Stal'" No 6, Vol. 7, p. 531

Use of dolomite bricks in improtant elements of furnaces was unsatisfactory because of their shrinkage and deformation due to high temperatures. From experiments, high-quality, water-resistant dolomite brick developed to replace magnesium and chrome-magnesium bricks. New brick will effect on quantity and quality of steel casting for present Five-Year Plan, since dolomite resources are available at almost all metallurgical processing areas.

PA 58T34

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19

Examination of water-resistant dolomite brick in service. O. V. [illegible] and D. [illegible]. Ogneupory 12, [illegible] (1947); cf. C.A. [illegible] —The new dolomite refractories are even better than chrome-magnesite brick. In cement kilns their stability is superior to the usual [illegible] brickwork. Their slag resistance in open-hearth conditions is excellent, owing to the development of a rather monolithic structure. [illegible] their life is 2 to 3 times that of dolomite brick. Chem. analyses show the changes in compn., in d., and in mech. strength of the different zones after service. The CaO satn. coeff. (KN) is characteristic for these zones as an indication of [illegible] CaO in the hottest parts. A relative enrichment of MgO is [illegible] with this phenomenon. However, brick made of 70% dolomite and 30% [illegible] in the hottest zone, a relative decrease in MgO and enrichment in CaO. In H_2O-resistant dolomite refractories the R_2O_3 content must be low to reduce fluxing, the MgO (as the most refractory oxide) must be high, and the CaO satn. coeff. must be as high as possible, but not over 1.0, in order to avoid a CaO crystn. [illegible] with the dolomite [illegible] the chem. compn. of the products [illegible] by the phase [illegible] in the system SiO_2–MgO–CaO in the brick parts. The most characteristic refractory phases are $3CaO.SiO_2$, $2CaO.SiO_2$, [illegible] (with FeO and MnO in [illegible]), $4CaO.Al_2O_3.Fe_2O_3$, $3CaO.Al_2O_3$, $5CaO.3Al_2O_3$, [illegible] and $2CaO.Fe_2O_3$ in the fluxes. The KN factor is decreased from [illegible] to 0.87 in dolomite, while in magnesite it is about 0.85 after service. The decompn. of $3CaO.SiO_2$ to $2CaO.SiO_2$ and free CaO and [illegible] are characteristic of reactions with [illegible] that the [illegible] is still low. This [illegible] of dolomite brick [illegible] The $3CaO.SiO_2$ in the [illegible] serves as a [illegible] against the formation of [illegible] Ca Mg silicates. The [illegible] of $3CaO.SiO_2$ below [illegible] does not cause disintegration [illegible] exterior slag-reaction zone protects the free CaO from hydration. W. [illegible]

SOV/81-59-9-32088

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 9, p 358 (USSR)

AUTHORS: Kukolev, G.V., Kivin, D.I., Zelenskaya, A.T., Lur'ye, M.A., Minskiy, Ya.M.

TITLE: Magnesite-Dolomite Highly-Refractory Products

PERIODICAL: Sb. nauchn. tr. Vses. n.-i. in-ta ogneuporov, 1958, Nr 2 (49), pp 277 - 296

ABSTRACT: The manufacture of magnesite-dolomite products from clinkers with various content of dolomite (D) and magnesite (M) in the raw material mixture of the clinker has been studied. Satka M and Karagay D served as raw material; for binding CaO, crystalline quartzite and iron scale were introduced; for the stabilization of β-$2CaO \cdot SiO_2$ an addition of phosphorite ore was introduced. The composition of the magnesite-dolomite charge was so calculated that a high ($\sim$1) coefficient of saturation with lime was obtained. Four charges were prepared: I - the ratio of M to D = 1:1; I' - the same with an increased content of scale, II and III with the ratio M to D = 1:2 and 2:1, respectively. Dried briquets from charges I, I' and II were burnt in the rotating furnace

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at 1,710 - 1,760°C and from charge III in the periodic furnace at 1,600°C; the burnt briquets were ground and from the powders (the grain composition is cited) products were formed and burnt: from charges I, I' and II at 1,430°C, from charge III at 1,460°C. A part of the raw bricks were left for hydraulic hardening for obtaining bricks without burning. The bricks from all the charges, in spite of the low burning temperature, have a high density (porosity 8,12 - 14,1%), high mechanical resistance ($\sigma_{compr.}$ 1,050-1,310 kg/cm^2) and a high temperature of deformation under load (the beginning of softening in I, I' and II takes place at 1,670, 1,540, 1,630°C, respectively, in III at 1,700°C softening did not begin). The content of highly-refractory phases was 86 - 88%. After a storing of 75 days, bricks without burning have also a high deformation temperature (in III there was no deformation at 1,700°C). The test of magnesite-dolomite bricks carried out in the laying of columns of the front wall of 30-t open-hearth furnaces has shown that these bricks are a completely suitable refractory material for them.

V. Zlochevskiy

131-58-6-8/14

AUTHORS: Kukolev, G. V., Kivin, D. I., Zelenskaya, A. T., Lur'ye, M. A., Minskiy, Ya. M.

TITLE: Water-Tight Magnesite-Dolomite Brick (Vodoustoychivyy magnesito-dolomitovyy kirpich)

PERIODICAL: Ogneupory, 1958, Nr 6, pp. 270 - 274 (USSR)

ABSTRACT: The investigations carried out by the Institute for Refractory Products showed that by combining magnesite and dolomite in the raw mixture for clinkers it is possible to obtain products of high quality, which was proved in the papers by G. V. Kukolev and D. I. Kivin (Reference 1). In carrying out the present work clinkers were produced by means of burning a calculated and controlled finely ground mixture of dolomite, magnesite, quartzite and phosphorite. The finely ground mixtures were produced according to the wet process. In table 1 some results of the laboratory investigations are mentioned. In the VNIIO experimental works several tons of synthetic water-tight magnesit-dolomite clinkers were produced and of it burned and unburned bricks were made. Furthermore the production of the masses is described in

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detail. The investigation of the samples after burning (tables 2 and 3) showed that the bricks of all masses showed a high density and mechanical strength notwithstanding the relatively low burning temperature. In testing the magnesite-dolomite as well as the usual magnesite bricks in practice the former proved to be of better quality. Thanks to the hydraulic hardening the unburned bricks showed after one day of storing a resistance to pressure of 63-83 kg/cm^2, after one month 294-340 kh/cm^2, and after 3 months 530-670 kg/cm^2, having good properties with all this. Furthermore a scheme for the production of magnesite-dolomite bricks is recommended and described in detail. The possibility and usefulness of vacuum filtering of the slip is proved by the work of G. Z. Dolgina (Reference 2). Unburned big magnesite-dolomite blocks can be produced of burned clinker powders in the villages where they are needed. For the metallurgy in the South, Siberia and other districts the production of bricks can be based on the mixture of dolomite and caustic magnesite with additions. These methods are also to be made use for saving magnesite and chromite ores. The production of unburned fireproof magnesite-dolomite products is to be organised in the works

departments for refractory products in the Ural mountains, on the condition that the ready magnesite-dolomite powder of the "Magnesit" will be supplied. Their production of the same burned and unburned products is to be organized in the Nikitovka dolomite Kombinat of dolomite and caustic magnesite with additions. The staff of editors of the periodical remarks on this in reference 3 that first of all a testing of these products of a great industrially produced amount of such bricks would be necessary. There are 3 tables and 2 references, 2 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut ogneuporov (All-Union Scientific Research Institute for Refractories)

1. Refractory materials--Production 2. Refractory materials--Analysis
3. Refractory materials--Test results

RODDATIS, K.F., kand.tekhn.nauk; KIVINZON, L.M., inzh.

Calculation of the stability of the hydrodynamic characteristics of the vertical pannels of once-through boilers. Teploenergetika 10 no.1:40-46 Ja '63. (MIRA 16:1)

1. Vsesoyuznyy zaochnyy energeticheskiy institut.
(Boilers)

EYZEN, O.G.; KIVIRYAKHK, S.V.; KOGERMAN, A.P.; LAUS, T.N.; APPO, I.Kh.

Chemical composition of tar from dictyonemic shale. Khim.i tekh.topl. i masel 5 no.9:37-42 S '60. (MIRA 13:9)

1. Institut khimii AN ESSR.
(Estonia--Oil shale)

KIVISAAR, E.

Treatment of injuries in the abdominal cavity and the inflammation of the stomach p. 69

SOTSIALISTLIK POLLUMAJANDUS. POLLUMAJANDUS MINISTEERIUM.
Tallin, Hungary. No. 1, 1958.

Monthly List of East European Accessions (EEAI) LC, Vol. 8, no. 11
November 1959.

Uncl.

KIVISAAR, E.

Pine twigs as a vitamin feed for sheep. p. 176.

SOTSIALISTLIK POLLUMAJANDUS. Tallinn, Hungary. Vol. 13, no. 4, Apr. 1958.

Monthly List of East European Accessions (EEAI), LC, Vol. 8, no. 12, Dec. 1959. Uncl.

KIVISHL'D, F., [redacted] (Tallin).

Large building blocks made of foam slate concrete. Gor. i sel'. stroi. no.2:6-7 F '57. (MLRA 10:6)
(Tallin--Concrete blocks)

KIVISEL'O, F.P., Cand Tech Sci -- (diss) "Study of the technology and properties of [redacted] shale under foamy cement." Tallin, 1958, 16 pp. (Min of Higher Education USSR. Tallin Polytechnical Inst) 150 copies (KL, 39-58, 109)

KIVISEL'G, F., kand. tekhn. nauk

Houses built of air-entrained kukersite blocks. Zhil. stroi. no.6:13-15 '59. (MIRA 12:10)
(Estonia--Lightweight concrete) (Estonia--Apartment houses)

KIVISILG, F.P., inzh.

Slate fly-ash concrete in the Estonian S.S.R. Trudy NIIZHB no.8:106-117 '59. (MIRA 13:4)

1. Institut stroitel'stva i stroitel'nykh materialov AN ESSR.
(Estonia--Lightweight concrete)

KIVISELG, Feliks, kand. tekhn. nauk; OJAMAA, Eugen, kand. tekhn. nauk; IVAND, H., insh., retsenzent; MASSO, T., red.

[Local building materials] Kohalikud ehitusmaterjalid. Tallinn, Eesti Riiklik Kirjastus, 1964. 278 p. [In Estonian] (MIRA 17:6)

SAKS, E.A.; KIVISELG, F.P. [Kiviselg, F.], kand. tekhn. nauk

Panels of shale-ash gas concrete. Stroi. mat. 10 no.6:29-30 Je '64. (MCRA 17:10)

1. Zamestitel' nachal'nika Upravleniya promyshlennykh stroitel'nykh materialov Soveta narodnogo khozyaystva Estonskoy SSR (for Saks).

16.4600 83859 S/023/60/000/002/002/003
C 111/ C 333

AUTHOR: Kivistik, L.

TITLE: On the Method of Steepest Descent for Solving Non-Linear Equations

PERIODICAL: Izvestiya Akademii nauk Estonskoy SSR. Seriya tekhnicheskikh i fiziko-matematicheskikh nauk, 1960, No. 2, pp. 145-159

TEXT: The author considers the equation

(1) $P(x) = 0$,

where $P(x)$ is non-linear operator from a real Hilbert space H in H which is twice differentiable in the sense of Frechet. Let the successive approximation of the solution of (1) be carried out according to the scheme

(2) $x_{n+1} = x_n + \xi_n P(x_n)$,

where ξ_n is the real root of

(3) $(P(x_n), P(x_n + \xi P(x_n))) = 0$.

The author proves the convergence of the method under weaker suppositions than Yu. Lumisti (Ref.1) ($P(x)$ need not be a

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83859
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0 111/ 0 333

On the Method of Steepest Descent for Solving Non-Linear Equations

potential operator) and Guan' Chzhaochzhi (Ref. 2) (instead of $(P'(x)h, h) \geq m \cdot \| \lambda \|^2$, $m > 0$, $h \in H$ for all $x \in X$ the same is only demanded for $x = x_0$, where x_0 is the initial approximation).

Then the author considers the modified method according to Altman (Ref.3). He proves convergence in this case too.

Two theorems deal with the uniqueness of the solution of (1).

8 theorems are given. As an example the author solves an integral equation according to Altman.

L. V. Kantorovich and M. M. Vaynberg are mentioned.

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C 111/ C 333

On the Method of Steepest Descent for Solving Non-Linear Equations

There are 5 references: 4 Soviet and 1 Polish.

ASSOCIATION: Institut energetiki Akademii nauk Estonskoy SSSR (Institute of Power Engineering of the Academy of Sciences Estonskaya SSR)

SUBMITTED: June 2, 1959

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[redacted]

S/023/60/000/003/006/012
C111/C222

AUTHOR: Kivistik, L.

TITLE: On Some Iterative Methods for Solving Operator Equations in the Hilbert Space

PERIODICAL: Izvestiya Akademii nauk Estonskoy SSR. Seriya Tekhnicheskikh i Fiziko-Matematicheskikh nauk, 1960, No.3, pp.229-241.

TEXT: Let $P(x)$ be an operator two times differentiable according to Frechet, from the real Hilbert space H into the same space. Generalising the arrangements of Altman (Ref.1-6) the author proposes the iteration methods

$$(4) \qquad x_{n+1} = x_n - \frac{\|P(x_n)\|^2}{\alpha(P'(x_n)y_n, P(x_n))} y_n, \quad n=0,1,\ldots, \quad \frac{1}{2} < \alpha < \infty$$

for the solution of the equation

$$(1) \qquad P(x) = 0.$$

Here x_0 is a known initial approximation and either $y_n = \overline{P'(x_n)}\, P(x_n)$ or $y_n = P(x_n)$, where $\overline{P}$ is the operator conjugated to P. It is proved

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On Some Iterative Methods for Solving Operator Equations in the Hilbert Space

that if $\|P(x_0)\| \leq \delta_0$; $\|P'(x)\| \leq A$, $\|P''(x)\| \leq B$ in a sphere $\|x-x_0\| \leq r = \frac{M\delta_0}{\alpha(1-q)}$; $\|\overline{P'(x)}h\| \geq \frac{1}{M}\|h\|$ for all $h \in H$, $(M>0)$ in the same sphere and $q = \frac{1}{\alpha}\sqrt{\alpha^2-2\alpha+M^2(A^2+B\delta_0)} < 1$, then the equation (1) has a solution in the mentioned sphere to which the iteration method (4) $y_n = \overline{P'(x_n)}P(x_0)$. An estimation for $\|x^*-x_n\|$ is given. Under weaker and stronger assumptions respectively, the author proves a number of further similar assertions. He points to contradictory assumptions in the paper of Altman (Ref.1) (compare Kivistik (Ref.7)). Finally (4) is replaced by the more general arrangement

$$x_{n+1} = x_n - \frac{\|P(x_n)\|^2 y_n}{\alpha_n(P'(x_n)y_n, P(x_n))}, \quad \frac{1}{2} \leq \alpha_n < \infty.$$

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C111/C222

On Some Iterative Methods for Solving Operator Equations in the Hilbert Space

B

Similar assertions of convergence are given for the new arrangement. There are 7 references: 1 Soviet and 6 Polish.

ASSOCIATION: Institut energetiki Akademii nauk Estonskoy SSR (Power Engineering Institute of the Academy of Sciences of the Esthonian SSR)

SUBMITTED: November 2, 1959

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21311
S/023/60/000/004/001/005
D221/D305

16.6500

AUTHOR: Kivistik, L.

TITLE: One generalization of Newton's method of approximation

PERIODICAL: Akademiya nauk Estonskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh i tekhnicheskikh nauk, no. 4, 1960, 301-312

TEXT: Let

$$P(x) = 0 \qquad (1)$$

be a non-linear operator in the Banach space X into the space Y of the same type. To solve this equation the author considers two iterated methods, based on

$$X_{n+1} = X_n - \alpha_n \Gamma(X_n)\, P(X_n) \qquad (2)$$

where $\Gamma(X) = [P'(X)]^{-1}$ and α_n are numbers within the interval (0.2) with some additional limitations. When $\alpha_n = 1$ $(n = 0,1 \ldots)$

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then Eq. (2) gives the well known Newton's method of approximation; if $0 < \alpha_n = \alpha < 1$ then Eq. (2) resolves into the generalized method of D.A. Grave as cited by L.V. Kantorovich (Ref. 1: Metode N'yutona (On the Newton Method), Tr. Matem. in-Ta im V.A. Steklova, 28, 1949, 104-144) [Abstractor's note: Surname Grave transliterated from Russian]. The congruence of the two methods is proved by the author with the help of theorems established by Kantorovich (Ref. 1: Op.cit.). First, a subsidiary theorem A is established. Let the following conditions be satisfied: 1) There exists an inverse operator $\Gamma(X_0) = [P'(X_0)]^{-1}$ and also $//\Gamma(X_0)// < B_0$; 2) $//\Gamma(X_0) P(X_0)// < \eta_0$; 3) for all $X \in S(X_0, r)$, where the symbol $S(X_0, r)$ denotes the sphere $//X-X_0// < r$ and r is given by

$$r = N(h_0)\,\eta_0 = \frac{1 - \sqrt{1 - 2h_0}}{h_0}\,\eta_0,$$

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the following inequality is satisfied $//P''(X)// \leq K$; 4) $h_0 = B_0 K\eta_0 \leq \frac{1}{2}$. Then equation $P(X) = 0$ has within the sphere $S(X_0, r)$ the solution X^*, to which converge necessitive approximations of Eq. (2), where $0 < \alpha_n = \alpha \leq 1$. The theorems proper, proving the convergence of Eq. (1) follow next. Theorem 1. Let conditions 1-4 of theorem A be satisfied and $0 < \alpha_n \leq 1$, $\alpha = \inf \alpha_n > 0$, then equation $P(X) = 0$ has within the sphere $S(X_0, r)$, the solution X^*, to which converge consecutive $\{X_n\}$ obtained from (1) and the following are the error estimates

$$//X^* - X_n// \leq N(\bar{h}_n)\ //\Gamma(X_n)\ P(X_n)// \leq N(h_0)\eta_0 \cdot q^n, \qquad (6)$$

where

$$\bar{h}_n = //\Gamma(X_n)//K//\Gamma(X_n)P(X_n)// \text{ and } q = \frac{1 - \alpha + \frac{1}{2}\alpha^2 h_0}{1 - \alpha h_0}.$$

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Theorem 2. If conditions 1-4 of theorem A are satisfied and numbers α_n chosen to satisfy

$$1 \geq \alpha_n > \frac{1 - \sqrt{1 - 2h_n(1 - \gamma h_n)}}{h_n}, \tag{21}$$

and also

$$\frac{1}{2} < \gamma < \frac{1 - h_0}{N(h_0)h_0} \tag{22}$$

is satisfied, then the error in approximations obtained by using Eq. (1) can be evaluated from formula

$$\|x^* - x_n\| < N(h_0)\eta_0(1 - h_0)^n \left[\frac{N(h_0)h_0}{1 - h_0}\right]^{2^n - 1} \tag{20}$$

or even more accurately from

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$$\|x^* - x_n\| \leq N(h_n)\eta_n \leq N)h_n) \frac{\eta_0 \cdot \gamma^{h_{n-1}} \cdots \gamma^{h_1} \cdot \gamma^{h_0}}{(1 - \alpha_{n-1}h_{n-1}) \ldots (1 - \alpha_0 h_0)} <$$

$$< \frac{N(h_0)\eta_0 \lceil \gamma N(h_0)h_0 \rceil^{2^n-1}}{(1 - \alpha_{n-2}h_{n-2})^{2^1-1} \ldots (1 - \alpha_0 h_0)^{2^{n-1}-1}} \leq \qquad (19)$$

$$\leq \frac{N^2(h_0)}{N(h_n)} \eta_0 (1 - \alpha_{n-1}h_{n-1}) \ldots (1 - \alpha_0 h_0) \lceil \gamma N^2(h_0)h_0 \rceil^{2^n-1}.$$

In the latter it is enough, instead of inequality (22), to satisfy the condition $\frac{1}{2} < \gamma < \lceil N^2(h_0)h_0 \rceil^{-1}$.

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Theorem 3. follows from Theorem 2. If conditions 1-4 of Theorem A are satisfied, the error in approximations, obtained by Newton's method can be evaluated from

$$\|x^{n} - x_n\| < N(\bar{h}_n)\|\Gamma(x_n)P(x_n)\| < N(h_n)\eta_n =$$

$$= \frac{N^2(h_0)}{N(h_n)}\eta_0\left[\prod_{k=0}^{n-1}(1-h_0)\right]\cdot\left[\frac{1}{2}N^2(h_0)h_0\right]^{2^n-1} <$$

$$< N(h_0)\eta_0(1-h_0)^n\left[\frac{N(h_0)h_0}{2(1-h_0)}\right]^{2^n-1},$$

where $\bar{h}_n = //\Gamma(X_n)//K//\Gamma(X_n)\,P(X_n)//$ and h_k $(k = 1, 2, \ldots)$ are determined recurrently by formula

$$\eta_{n+1} = \frac{1}{2}\frac{h_n}{1-h_n}\eta_n, \qquad (23)$$

$$h_{n+1} = \frac{1}{2}\frac{h_n^2}{(1-h_n)^2}.$$

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Theorem 3 for $h_0 < \frac{1}{2}$ gives a better error estimate than that obtained using the Kantorovich (Ref. 1: Op.cit.) method or by S.Yu. U'lm (Ref. 2: O skhodimosti nekotorykh iteratsionnykh protsessov v prostranstve Banakha (On the Convergence of some Iterative Processes in the Banach Space), Uch. zap. Tartuak. Gos. un-ta, 42, 1956, 135-142). Theorem 4. Let the following conditions be satisfied. 1) There exists an inverse operator $\Gamma(X_0) = [P'(X_0)]^{-1}$ with $\|\Gamma(X_0)\| \leq B_0$; 2) $\|\Gamma(X_0)\, P(X_0)\| \leq \eta_0$; 3) for all $X \in S(X_0, r)$, where

$$r = \frac{B\eta_0}{1-q} \text{ and } q = \max\left\{\frac{|1-\alpha| + \frac{1}{2}\alpha^2 h_0}{1-\alpha h_0}, \right.$$

$$\left. \frac{B - 1 + \frac{1}{2}B^2 h_0}{1 - Bh_0}\right.$$

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there is an estimate $//P''(X)// < K$; 4) The inequalities

$$/1 - \alpha/ + \frac{1}{2}\alpha^2 h_0 \leq (1 - \alpha h_0)^2,$$

and

$$\beta - 1 + \frac{1}{2}\beta^2 h_0 \leq (1 - \beta h_0)^2, \quad \beta h_0 < 1,$$

where $h_0 = B_0 K \eta_0$; Equation $P(X) = 0$ then has within the sphere $S(X_0, r)$ the solution x^*, to which converge the consecutive approximations X_n as obtained from Eq.(2), where $0 < \alpha_n < 2$ and the error estimate becomes

$$//X^* - X_n// \leq \frac{\beta}{1 - q}//\Gamma(X_n)//\ P(X_n)// < \frac{\beta\eta_0}{1 - q}\, q^n. \quad (24)$$

Let the limit of the norm of operator $\Gamma(x)$ now be known in the

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whole of the domain (Ref. 3: I.P. Mysovskikh, K voprosu O skhodimosti metoda N'yutona (On the Convergence of the Newton Method), Tr. Matem., in-ta im. V.A.Steklova, 28, 1949, 145-147), and (Ref. 4: O skhodimosti metoda L.V. Kantorovicha dlya resheniya nelineynykh funktsional'nykh uravneniy i ego primeneniyakh (On the Convergence of the L.V. Kantorovich method for Resolving Non-Linear Functional Equations and its Uses), Vestn. Leningr. un-ta, no. 11, 1953, 25-48). If $0 < \alpha_n \leq 1$, $\alpha = \inf \alpha_n > 0$, $\beta = \sup \alpha_n$ then the following Theorem 5 holds: Let the following conditions be satisfied: 1) $//P(X_0)// \leq \delta_0$; 2) For all $X \in S(X_0, r)$, where

$$r = \frac{\beta B \delta_0}{1 - q},$$

there exists the operator $\Gamma(X)$ with $//\Gamma(X)// \leq B$. 3) For all $X \in S(X_0, r)$ $//P''(X)// \leq K$; 4) $\beta h_0 = \beta B^2 K \delta_0 < 2$. Then $P(X) = 0$ has

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within the sphere $S(X_0, r)$ the solution X^*, to which converge the consecutive approximations X_n obtained from Eq. (2) and the following estimate exists.

$$//X^* - X_n// \leqslant \frac{\beta B}{1-q} //P(X_n)// \leqslant \frac{\beta B \delta_0}{1-q} \cdot q^n,$$

where $q = \max \left\{1 - \alpha + \frac{1}{2}\alpha^2 h_0,\ 1 - \beta + \frac{1}{2}\beta^2 h_0\right\}$.

Let conditions 2 and 3 of Theorem 5 be satisfied for all elements X of a certain sphere $S(X_0 R)$. Making α small enough it may always be that $\alpha h_0 < 2$ and $r = r(\alpha) \leqslant R$ if only $R > B\delta_0$. The next theorem can, therefore, be formulated as Theorem 6. If within a certain sphere $S(X_0, R)$ where $R > B //P(X_0)//$, there exists the inverse operator $\Gamma(X) = [P'(X)]^{-1}$ the norm of which is limited by

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number B $//\Gamma(X)// < B$ and $//P''(X)//$ is also limited within sphere $S(X_0, R)$, then $P(X) = 0$ has a solution within this sphere and also the converging to this solution. Approximations can be determined from Eq. (2) where $\alpha_n = \alpha$ and α = a sufficiently small positive number. A more generalized method of evaluation follows given as

$$X_{n+1} = X_n - A_n \Gamma(X_n) P(X_n), \tag{25}$$

where A_n are arbitrary linear operators from space $\mathfrak{X}$ into the same space. In particular if $A_n = \alpha_n E$, where $\alpha_n \in (0.2)$ - the method of Eq. (2) is obtained. Using the Taylor formula and identity

$$P(X_n) = P'(X_n) \Gamma(X_n) P(X_n)$$

and

$$P(X_{n+1}) = P'(\xi_n)(E - A_n) \Gamma(X_n) P(X_n) + R_n \tag{28}$$

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is obtained from which

$$\Gamma(X_{n+1})\, P(X_{n+1}) = H_n(E - A_n)\, I(X_n)\, P(X_n) + \Gamma(X_{n+1})\, R_n \qquad (29)$$

follows, where

$$//R_n// < \tfrac{1}{2}\, //P''(X_n + \tau_n(X_{n+1} - X_n))//\ //X_{n+1} - X_n//^2,\ 0 < \tau_n < 1$$

and $H_n = \left[E - \Gamma(X_n)(P'(X_n) - P'(X_{n+1}))\right]^{-1}$. Using the identity (29) and the methods of deducing previous theorems the following theorems can be obtained: Theorem 7. Let the following conditions be satisfied: 1) There exists the inverse operator $\Gamma(X_0) = \left[P'(X_0)\right]^{-1}$, with $//\Gamma(X_0)// < B_0$; 2) $//\Gamma(X_0)\, P(X_0)// < \eta_0$; 3) For all $x \in S(X_0, r)$, where $r = \frac{b\eta_0}{1 - q}$, there is an error esti-

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One generalization of ... mate $//P^n(X)// < K$; 4) The inequality $e + \frac{1}{2} b^2 h_o < (1 - bh_o)^2$ is satisfied, where $bh_o = bB_o K\eta_o < 1$, $b = \sup \alpha_n < 2$, $q = \frac{e + \frac{1}{2} b^2 h_o}{1 - bh_o}$, and α_n and e are determined from

$$//E - A_n// \leq e_n, \quad //A_n// \leq \alpha_n, \tag{26}$$

and

$$e_n \leq e < 1. \tag{27}$$

Then $P(X) = 0$ has within the sphere $S(X_o, r)$ the solution X^*, to which converge the consecutive approximations X_n obtained from Eq. (25) and the error estimates become as given by

$$//X^* - x_n// \leq \frac{b}{1 - q} // \Gamma(X_n)\ P(X_n)// < \frac{b\eta_o}{1 - q} \cdot q^n.$$

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Theorem 8. Let the following conditions be satisfied: 1) There exists the inverse operator $\Gamma(X_0) = [P'(X_0)]^{-1}$, with $\|\Gamma(X_0)\| \leq B_0$; 2) $\|\Gamma(X_0)\, P(X_0)\| \leq \eta_0$; 3) For all $x \in S(X_0, r)$, where $r = \frac{b\eta_0}{1 - (1 - bh_0)l_0}$ the inequality $\|P''(X)\| \leq K$ is satisfied;

4) The operators A_n are chosen so that for all n $e_n + \frac{1}{2}q_n^2 h_n \leq \gamma h_n$ holds, where γ satisfies the condition $\frac{1}{2} \leq \gamma < \frac{(1 - bh_0)^2}{h_0}$ and $bh_0 = bB_0K\eta_0 < 1$ and $h_n (n > 1)$ are determined by the recurrent relationship

$$h_n = \frac{e_{n-1} + \frac{1}{2}q_{n-1}^2 h_{n-1}}{(1 - e_{n-1} h_{n-1})^2} h_{n-1}.$$

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Then $P(X) = 0$ has within the sphere $S(X_0, r)$ the solution X^*, to which converge the consecutive approximations X_n obtained from (25) and the error evaluations become

$$//X^* - X_n// < \frac{b\eta_0 (1 - bh_0)^n}{1 - (1 - bh_0) l_0^{2^n}} \cdot l_0^{2^n - 1},$$

where $l_0 = \frac{\gamma h_0}{(1 - bh_0)^2}$ ($b = \sup \alpha_n$). The application of (2) and of (25) may be considered as an approximate evaluation of the consecutive approximation of $P(X) = 0$ using the Newton Method.

$$X_{n+1} = X_n - \Gamma(X_n) P(X_n) \qquad (30)$$

thus, if consecutive approximations X_{n+1} are determined in the

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sense that instead of the increment - $\Gamma(X_n)\ P(X_n)$ a certain other element - $\alpha_n \Gamma(X_n)\ P(X_n)$ or $A_n \Gamma(X_n)\ P(X_n)$ is found, in which $\alpha_n \varepsilon$ (0.2) or $//E - A_n// < e < 1$ respectively, then the obtained approximations still converge towards the exact solutions (Theorems 1, 4, 5, 6, 7). If the permissible error is not too great the convergence will still remain that of the second order (Theorems 2, 8).

[Abstractor's note: No definitions of symbols are given by the author. Although it is not mentioned explicitly - all symbolic notation seems to follow that used by L.V. Kantorovich in Ref. 1: Op. cit.]. There are 6 Soviet-bloc references.

ASSOCIATION: Institut kibernetiki akademii nauk Estonskoy SSR (Institute of Cybernetics of the Academy of Sciences of Estonian SSR).

SUBMITTED: February 10, 1960

Card 16/16

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S/020/61/136/001/002/037
C111/C222

AUTHOR: Kivistik, L.A.

TITLE: On a Modification of the Iterative Method With Minimal Residuals for the Solution of Nonlinear Operator Equations

PERIODICAL: Doklady Akademii nauk SSSR, 1961, Vol. 136, No. 1, pp.22-25

TEXT: Let $P(x)$ be an operator from H into H which is two times differentiable according to Frechet, let H be a real Hilbert space. The solution of

(1) $$P(x) = 0$$

is carried out with the arrangement

(2) $$x_{n+1} = x_n + \varepsilon_n y_n, \quad n = 0,1,\ldots ,$$

where $x_0 \in H$ is the initial approximation, ε_n is chosen so that for a fixed y_n the expression $\|P(x_n) + P'(x_n)(x_{n+1} - x_n)\|^2 = \|P(x_n) + \varepsilon_n P'(x_n)y_n\|^2$ becomes minimal.

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On a Modification of the Iterative Method With Minimal Residuals for the Solution of Nonlinear Operator Equations

Let $y_n = P(x_n)$. Then one obtains the method

$$(6) \qquad x_{n+1} = x_n - \frac{(P(x_n),\ P'(x_n)P(x_n))}{\|P'(x_n)P(x_n)\|^2} P(x_n)$$

Theorem 1: Let the following conditions be satisfied :

1° $\|P(x_0)\| \leq \delta_0$

2° For all $x \in S(x_0, r)$, where $r = \frac{M\delta_0}{1-q}$, and $S(x_0, r)$ denotes the sphere $\|x - x_0\| \leq r$ let :

a) $\|P'(x)'\| \leq A$ b) $\|P''(x)\| \leq B$ c) $|(P'(x)h, h| \geqslant M^{-1}\|h^2\|$ for all $h \in H (M>0)$

3° $q = \sqrt{1-b^{-1}} + \frac{1}{2} a_0 < 1$, where $b = M^2A^2$, $a_0 = M^2B\delta_0$.

Then (1) has a unique solution x^* in $S(x_0, r)$ to which there converges

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On a Modification of the Iterative Method With Minimal Residuals for the Solution of Nonlinear Operator Equations

the sequence $\{x_n\}$ obtained by (6), where

(7) $$\|x^* - x_n\| \leq M \|P(x_n)\| \leq M \delta_0 q^n$$

Theorem 2 : Let

1° $\|P(x_0)\| = \delta_0 \leq \bar{\delta}_0$

2° $|(P'(x_0)h,h| \geq M_0^{-1} \|h\|^2$ for all $h \in H$ $(M_0 > 0)$.

3° Let $\|P'(x)\| \leq A$, $\|P''(x)\| \leq B$ be valid for all $x \in S(x_0,r)$, where $r = \frac{1}{B}\left(\frac{1}{M_0} - \frac{1}{M^2}\right)\frac{\delta_0}{\delta_0}$ $(M^* = \lim M_n \leq +\infty)$.

4° Let the magnitudes $a_0 = M_0^2 B \bar{\delta}_0$ and $b_0 = M_0^2 A^2$ be so that the sequence $\{a_n\} = \{M_n^2 B \bar{\delta}_n\}$ calculated with the aid of the recurrence formulas

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$$M_{k+1} = \frac{M_k}{1 - M_k^2 B \bar{\delta}_k}$$

(8)

$$\bar{\delta}_{k+1} = \bar{\delta}_k \left(\sqrt{1 - (M_k^2 A^2)^{-1}} + \frac{1}{2} M_k^2 B \bar{\delta}_k\right)$$

is convergent (i.e. that $a_n < 1$ for all n).

Then (1) has a solution x^* in $S(x_0, r)$ to which there converges the sequence $\{x_n\}$ obtained by (6), and here it is

$$(9)\quad \|x^* - x_n\| \leq \frac{2M_n \delta_n}{1 + \sqrt{1 - 2M_n^2 B \delta_n}} < 2M_n \delta_n$$

where $\delta_n = \|P(x_n)\|$ and M_n is determined according to (8). If $M^r < \infty$ or $\delta_0 > \delta_0$ then the solution is unique in $S(x_0, r)$.

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On a Modification of the Iterative Method With Minimal Residuals for the Solution of Nonlinear Operator Equations

Theorem 3 : If $a_o b_o \leq \frac{1}{6}$ then the condition 4° of theorem 2 is satisfied.

Choosing $y_n = \overline{P'(x_n)}\, P(x_n)$, where $\overline{P'(x)}$ is adjoint to the linear operator $P'(x)$ then one obtains the method

$$(10) \quad x_{n+1} = x_n - \frac{\| \overline{P'(x_n)}\, P(x_n) \|^2}{\| P'(x_n)\, \overline{P'(x_n)}\, P(x_n) \|^2}\, \overline{P'(x_n)}\, P(x_n)$$

Theorem 5 : Let the conditions of theorem 2 be satisfied with the exception of the condition 2° and the relations (8) which are replaced by the condition

$\| P'(x_o)h \| \geq M_o^{-1} \| h \|$ and $\| \overline{P'(x_o)}h \| \geq M_o^{-1} \| h \|$ for all $h \in H$ ($M_o > 0$) and the relations

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On a Modification of the Iterative Method With Minimal Residuals for the Solution of Nonlinear Operator Equations

$$(11)\quad M_{k+1} = \frac{M_k}{1 - M_k^2 B \overline{\delta}_k}, \quad \overline{\delta}_{k+1} = \overline{\delta}_k \left(\frac{M_k^2 A^2 - 1}{M_k^2 A^2 + 1} + \frac{1}{2} M^2 B \overline{\delta}_k \right)$$

Then (1) has a solution x^* in $S(x_0, r)$ to which there converges the sequence $\{x_n\}$ obtained with the aid of (10), and there hold the estimations (9), where $\delta_n = \| P(x_n) \|$, and M_n are calculated according to (11).

Theorem 6 : If $(b_0 + 1)(g - 12a_0 + 8a_0^2 - 2a_0^3)a_0 \leq 4$ and $a_0 \leq 4/g$, then the condition 4^0 of theorem 5 is satisfied.

The author mentions M.A. Krasnosel'skiy and S.G. Kreyn. There are 3 references : 2 Soviet and 1 American.

ASSOCIATION: Institut energetiki Akademii nauk Estonskoy SSR (Power Engineering Institute of the Academy of Sciences Estonskaya SSR)

PRESENTED: July 15, 1960, by S.L. Sobolev, Academician
SUBMITTED: June 14, 1960

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KIVISTIK, L. A.

Cand Phys-Math Sci - (diss) "Iteration methods in Hilbert space." Tartu, 1961. 10 pp; (Tartu State Univ); 250 copies; free; bibliography at end of text (15 entries); (KL, 5-61 sup, 173)

KIVISTIK, L.A.

[redacted] method with minimal residues for the solution of nonlinear operator equations. Dokl.AN SSSR 136 no.1: 22-25 Ja '61. (MIRA 14:5)

1. Institut energetiki Akademii nauk Estonskoy SSR. Predstavleno akademikom S.L.Sobolevym.
(Differential equations, Partial) (Operators (Mathematics))

A semiworks plant for the thermal conversion of oil-shale fines. N. M. Kunshov, S. L. Epshtein, B. I. Tyagunov, and A. A. Kivit. Gazovaya Prom. 1956, No. 3, 8-15.—An Estonian plant for working up 230 tons/day of low-grade oil-shale fines, contg. approx. 6% moisture, 46% ash, 16% CO_2 and 30% org. matter, operates at 750 to 800°. Liquid products representing 16% of the dry wt. of the shale consist of 15-31% light oils, 63-75% heavy oils, and 6-27% tars. Gas yields with thermal values from 10,000 to 12,000 kcal./cu. m. run from 38 to 46 cu. m./ton. The gas compn. is CO_2 8.5, C_2H_4 12.0, C_2H_6 9.2, C_3H_6 7.6, C_3H_8 8.9, C_4H_8 4.2, C_4H_{10} 1.1, CO 0.8, H_2 7.6, CH_4 16.7, N_2 10.8, and C_5 and higher 3.1%. The ash shows promise as a raw material for making cements of the so-called "Kuchen" type. On the basis of the exptl. results, plans are being drawn up for the construction of a full-scale plant with [illegible]

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KIVI I, A.A.

AARNA, A.Ya. [Aarna, A.J.], doktor tekhnicheskikh nauk, retsenzent; KULL', M. [Kull, M.], kandidat ekonomicheskikh nauk, retsenzent; KYLL', A.P. [Kõll, A.P.], redaktor; KIVI, A.A., redaktor; MIKHELIS, K.A. [Mihelis, K.A.], redaktor; GUBERGRITS, Mark Yakovlevich, redaktor; ROGINA, O.M., vedushchiy redaktor; YASHCHURZHINSKAYA, A.B., tekhnicheskiy redaktor

[Engineering and economic problems of industrial semicoking of combustible shale; a collection of papers] Voprosy tekhniki i ekonomiki promyshlennogo polukoksovaniia goriuchikh slantsev; sbornik statei. Leningrad, Gos.nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, Leningr.otd-nie, 1957. 337 p. (MLRA 10:7)

1. Kivioli Polevkiviksonia Kombinaat.
(Oil shales)

KIVIT, A.A., red.; ANTONS, R.I., red.; AARNA, A.Ya., prof., doktor tekhn.nauk, retsenzent; KULL', E.V., kand.ekon.nauk, retsenzent; RAZINA, O.M., vedushchiy red.; YASHCHURZHINSKAYA, A.B., tekhn.red.

[Technology and economic aspects of the industrial semicoking of oil shales] Voprosy tekhniki i ekonomiki promyshlennogo polukoksovaniia goriuchikh slantsev. Leningrad, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, Leningr.otd-nie. No.2. 1959. 429 p. (MIRA 12:10)

1. Kiviõli Põlevkiviõksamia Kombinaat.
(Oil shales)

KUZNETSOV, Dmitriy Trofimovich; ZHUKOV, V.A., dotsent, retsenzent; KIVIT, A.A., nauchnyy red.; NIKOLAYEV, G.A., nauchnyy red.; KOZINA, O.M., vedushchiy red.; YASHCHURZHINSKAYA, A.B., tekhn.red.

[Outline of the development of the oil-shale industry in the Estonian S.S.R.] Ocherki razvitiia slantsevoi promyshlennosti Estonskoi SSR. Leningrad, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, Leningradskoe otd-nie, 1960. 199 p. (MIRA 13:6)

1. Zaveduyushchiy kafedroy khimicheskoy tekhnologii Leningradskogo inzhenerno-ekonomicheskogo instituta (for Zhukov).
(Estonia--Oil shales)

KIVIVYALI, B.T.

Manufacturing skis of plywood. Der.prom. 8 no.6:24-25 Je '59. (MIRA 12:8)

1. Tallinskaya lyzhnaya fabrika "Dinamo."
(Skis and skiing)

PEHME, K.M. [Pehme, K.]; KIVIVALI, B.T.[Kivivõli, B.]

Design and technology for the manufacture of skis from plywood. Der.prom. 9 no.3:21 Mr '60.
(MIRA 13:6)

1. Lyzhnaya fabrika Estonskogo respublikanskogo soveta "Dinamo".
(Estonia—Skis and skiing)

KIVIVYALI, E.T. [Kiviväli, E.T.]; KERDE, R.Kh. [Kärde, R.H.]

Efficient cutting of logs for the manufacture of multiple layer skis. Der.prom. 9 no.9:19-21 S '60. (MIRA 13:9)
(Estonia--Skis and skiing) (Woodwork)

KIVKIND, A. I. (Kazan)

"Proton Resonance in Paramagnetic solutions, paper presented at the International Conference on Physics of Magnetic Phenomena, Sverdlovsk, USSR, 23-31 May 1956.

KIVKUTSAN, F. R.

USSR/Chemistry - Biochemistry

Card 1/1 ; Pub. 22 - 29/44

Authors ; Sisakyan, N. M., Memb. Corresp. of Acad. of Sc. USSR; Besinger, E. N.; and Kivkutsan, F. R.

Title ; Amino-acid composition of phycoerythrin

Periodical ; Dok. AN SSSR 98/1, 111-114, Sep 1, 1954

Abstract ; The amino-acid composition of phycoerythrin (chromoprotein) derived from Callithamnion rybosum algae and containing 10.61% of N per dry weight, was investigated. The amino-acids were identified by the method of distributive chromatography on paper. The results obtained are shown in tables. Sixteen references: 8-USA; 3-German and 5-USSR (1928-1954). Tables; drawings; illustrations.

Institution ; Acad. of Sc. USSR, The A. N. Bakh Institute of Biochemistry

Submitted ; June 11, 1954

KIVMAN, A.M.

Pneumatic high-frequency drilling hammers. Biul.tekh.-ekon.inform. no.7:6-7 '58. (MIRA 11:9)
(Boring machinery)

KIVMAN, A.M.

The 130-10 pneumatic breaking hammer. Biul.tekh.-ekon.inform. no.4:
7-8 '59. (MIRA 12:7)
(Coal mining machinery)

KIVMAN, A.M., inzh.

Select the best models of air drills. Shakht. stroi. 7 no.2:6-9 F '63. (MIRA 16:3)

1. Zavod "Pnevmatika", Leningrad.
(Boring machinery—Pneumatic driving)

KIVMAN, F.M.

Control device for the measurement of forging shifts. Kuz.-shtam.proizv. 4 no.8:47 Ag '62. (MIRA 15:8)
(Forging machines--Attachments)

KIVMAN, G. Ya., [illegible]TKOV, I. L. and [illegible]GOVITSKIY, Ye. B.

"Apparatus for the Graphic Recording of Changes in the Lumen of Blood Vessels During Physiological Experiment." Farmakol i Toksikol, No. 2, p 57, 1951.

KIVMAN, G. YA.

USSR/Medicine, Biology - Antibiotics Jul/Aug 52

"Control of Streptomycin in Regard to Toxicity and Pyrogenicity," A. Ye. Tebyakina, G. Ya. Kivman, Control Inst of Sera and Vaccines imeni L. A. Tarasevich

"Med Prom" No 4, pp 42-44

Describes in detail procedures for testing toxicity on mice and pyrogenicity on rabbits in order to control the quality of streptomycin.

22879

1. KIVMAN, G. Ya
2. USSR (600)
4. Antibiotics
7. Antibiotics as stimulants of growth in animals, Antibiotiki, 5, No. 4, 1952.
9. Monthly List of Russian Accessions, Library of Congress, February 1953, Unclassified.

TEBYAKINA, A.Ye.; SHIRYAYEVA, V.L.; KIVMAN, G.Ye.

Comparative study of methods of determining the activity of penicillin.
Trudy VNIIA no.1:97-104 '53. (MLRA 8:1)

1. Is Tsentral'nogo gosudarstvennogo nauchnogo kontrol'nogo instituta im. Tarasevicha (direktor S.I.Didenko).
(Penicillin)

KIVMAN, G. Ya.

Antibiotics

Allergy to antibiotics. Antibiotiki. 6, No. 1, 1953.

9. Monthly List of Russian Accessions, Library of Congress, June 1953, Uncl.

KIVMAN, O.Ya., kandidat meditsinskikh nauk.

Effect of antibiotics on the growth of animals. Priroda 42 no.11:98-100 N '53. (MLRA 6:11)

1. Gosudarstvennyy kontrol'nyy institut im. L.A.Tarasevicha. (Antibiotics) (Growth)

KIYKAN, O.Ya., kandidat meditsinskikh nauk.

Effect of antibiotics upon the protective reactions in the body. Antibiotiki 7 no.2:14-27 '54. (MLRA 7:4)
(Antibiotics)

KIYMAN, O.Ya. (Moskva)

Effect of antibiotics on growth of animals and plants. Usp. sovr. biol. 38 no.2:163-182 S-O '54. (MLRA 8:1)

(ANTIBIOTICS, effects,
on growth of animals & plants)
(PLANTS, effect of drugs on,
antibiotics, on growth)
(GROWTH, effect of drugs on,
antibiotics, in animals & plants)

KIVMAN, G. YA.
USSR/Biochemistry

Card 1/1

Authors : Sisakyan, N. M; Beninger, E. M; Carkavi, P. O., and Kivman, G. Ya.

Title : Simple method determining amino-acids through chromatographic analysis on paper.

Periodical : Dokl. AN SSSR, 96, No. 2, 343 - 346, May 1954

Abstract : Determination of amino-acids is carried out by a two-dimensional chromatographic method. The initial process of separation is accomplished with the aid of methyl alcohol - water - pyridine (40 : 10 : 2) and the second and final process with n-butyl alcohol - methylethylketone - water - diethylamine (20 : 20 : 10 : 2). The solvents require no preliminary purification. The appearance of amino-acid on the paper is attained by treating the latter in a 0.4-% ninhydrin solution in methyl alcohol, in acetone or n-butyl alcohol. One reference. Table, photos.

Institution : Acad. of Sci. USSR, The A. N. Bakh Inst. of Biochemistry and the State Control Inst. of Serums and Vaccines at the Ministry of Health USSR.

Submitted : March 13, 1954

MIH translation in /M ... Translation - B-93873, 28 Dec 55

TSEBYANKINA, A.Ye.; KIVMAN, G.Ya.; SVIRSKAYA, S.I.

Pharmacological control of streptomycin. Med.prom. no.1:23-26 Ja-Mr '55. (MLRA 8:5)

1. Kontrol'nyy institut syvorotok i vaktsin imeni Tarasevicha.
(STREPTOMYCIN, standard)

KIVMAN, G. Ya.

KIVMAN, G.Ya., kandidat meditsinskikh nauk

Effect of antibiotics on the liver in men and animals. Antibiotiki 8 no.1:19-24 '55. (MLRA 8:3)

(LIVER, effect of drugs on, antibiotics)
(ANTIBIOTICS, effects, on liver)

KIVMAN, G.Ya., kandidat meditsinskikh nauk; KHASKIN, L.S.

Utilization and sterilization of side products obtained during production of antibiotics; review of foreign periodical literature. Antibiotiki 8 no.2:25-36 '55. (MLRA 8:5)

(ANTIBIOTICS, preparation of,
use of side products, review)
(DRUG INDUSTRY,
use of side products in antibiotic indust., review)

KIYMAN, G.Ya.; PRYADKINA, M.D.; GUTOROVA, N.M.

Preparation for the detection and stimulation of growth of Vibrio comma. Zhur. mikrobiol. epid. i immun. no.12:61-66 D '55. (MLRA 9:5)

1. Iz laboratorii Gosudarstvennogo kontrol'nogo instituta syvorotok i vaktsin imeni L.A. Tarasevicha (dir.-S.I. Didenko)

(VIBRIO COMMA, culture,
medium containing Bacillus mesentericus filtrates for detection & stimulation of growth.)
(BACILLUS,
mesentericus, filtrates in culture media for detection & stimulation of growth of Vibrio comma)
(CULTURE MEDIA,
for Vibrio comma, eff. of Bacillus mesentericus filtrates in detection & stimulation of growth)

KIVMAN, G.Ya.

Dynamics of the binding of tetracyclines by the liver. Antibiotiki 1 no.3:42-46 My-Je '56. (MIRA 9:10)

1. Otdel eksperimental'noy khimioterapii (zav. chlen-korrespondent AMN SSSR prof. Kh.Kh.Planel'yes) Instituta farmakologii i eksperimental'noy khimioterapii AMN SSSR
(LIVER, metabolism,
tetracycline, binding (Rus))
(TETRACYCLINE, metabolism,
liver, binding (Rus))

"Second Volume of Works on Biomycin," by O. Ya. Kiyman, Antibiotiki, Vol 1, No 5, Sep/Oct 56, pp 99-100

This work reviews a collection of articles on the antibiotic, biomycin issued under the editorship of Z. V. Ermol'yeva and A. F. Bilibin. The volume contains articles with data on the spectrum of action of biomycin, its therapeutic forms, experimental therapy, clinical application, and effect on animal growth.

Prof L. Yakobson and associates report that they established the high activity of biomycin in regard to various groups of microbes. It must be regretted, however, that the spectrum of action of biomycin described in the article does not include the causative agents of the more dangerous infections.